BUILDING CONSTRUCTION
12-22-32

INDUSTRIAL EDUCATION
Curriculum Guide

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NOTE: This Curriculum Guide is a service publication only. The Senior High School Program of Studies contains the official statement concerning Senior High School courses. The information contained in the guide is prescriptive insofar as it duplicates that contained in the Program of Studies. There are in the Guide, however, as well as content, methods of developing the concepts, suggestions for the use of teaching aids and lists of additional reference books.

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INDUSTRIAL EDUCATION

RATIONALE

Industrial Education is a program consisting of courses which provide a continuum of experiences, starting with exploratory activities in the junior high school and expanding in the high school to the development of skills related to career fields. This development of the student's skills is planned for through courses in industrial and vocational education culminating in on-the-job work experience, or entry into a job or post-high school institution for further education.

The program consists of courses ranging from those designed for an exploration of the technologies and trade areas to units of practical preparation for a career. In the process the courses develop the student's self-knowledge, talents and skills.

For information on sequencing and course description, refer to the "Handbook In Industrial Education for Guidance to Teachers, Counsellors and Administrators".

PROGRAMS

There are two parts to the Industrial Education program. The first part consists of the I.E. 10, 20, 30 series of courses and is designed for career orientation. These courses were developed primarily for students in laboratories that utilize the multiple activity approach as found in most smaller schools, but they can be taught in unit shops as well.

The second part consists of the I.E. 12, 22, 32 series of courses and is intended for career development. The courses are planned for use in schools where facilities are available to teach specific occupational areas.

Students may progress from the I.E. 10, 20, 30 series to the 22 level courses upon meeting specified basic prerequisites or upon recommendation of their principal.

Both sections of the program focus on seven career fields. These are:

Graphic Communications
Mechanics
Construction and Fabrication
Electricity-Electronics
Personal Services
Performing Arts
Horticulture

The I.E. 10, 20, 30 courses consist of a number of one credit modules related to the career fields while the I.E. 12, 22, 32 courses consist of a number of five credit modules of specific occupational content. Completion of seven five credit modules qualifies the student for recognition by the Apprenticeship Branch for credit towards a journeyman's certificate.

It is left to the administrators of the school to offer the courses or combination of courses best suited to the needs and interests of the students and the financial resources of the district.

Courses offered at the 22 and 32 level have to meet special criteria for staff and facilities. The Industrial Education Consultant must authorize these in order to qualify the students for vocational grants.

OBJECTIVES OF INDUSTRIAL EDUCATION

The Industrial Education Program can help achieve the Goals of Schooling and Education. The course objectives are more focused and give direction to the teacher.

The objectives of Industrial Education are classified in three areas with the following purposes:

A. Personal Growth:

To provide opportunities for the individual growth of the student through the development of acceptable personal and social values necessary in a productive society.

1. To provide a technical environment which motivates and stimulates individuals to discover their interests and develop personal and social responsibilities.

2. To assist in the development of positive attitudes toward safety.

3. To assist in the development of positive attitudes toward conservation and environment.

4. To assist in the development of consumer literacy.

B. Career Exploration:

To develop basic competencies, integrating cognitive and psychomotor skills to enter a family of occupations or post-secondary institutions for further education.

1. To provide exploratory experiences in the use of tools, equipment and materials appropriate to various technologies prevalent in a productive society.
2. To develop an understanding of the interrelationship of various technologies.
3. To provide a technical environment for students to synthesize their accumulated knowledge in the solution of practical problems.
4. To assist the student to develop habits that will be conducive to the establishment of a safe environment.

C. Occupational Skills:

To develop basic competencies, integrating cognitive and psychomotor skills related to families of occupations.

1. To provide safe exploratory experiences in the use of tools, energy, equipment and materials appropriate to various technologies prevalent in a productive society.
2. To develop an understanding of the interrelationships of various technologies.
3. To provide a technical environment which permits students to synthesize their accumulated knowledge in the solution of practical problems, and to assist students to develop habits that will be conducive to the establishment of a safe environment.

INDUSTRIAL EDUCATION 12, 22, 32 PROGRAM

INTRODUCTION

The Industrial Education 12, 22, 32 program is a series of modules which develop competencies leading to seven different career fields.

Entry into a career field may be gained by taking one of several introductory courses. These are:

1. the "12" course designated for each major, or

2. two modules from the Industrial Education "10, 20, 30" series related to the anticipated major, or

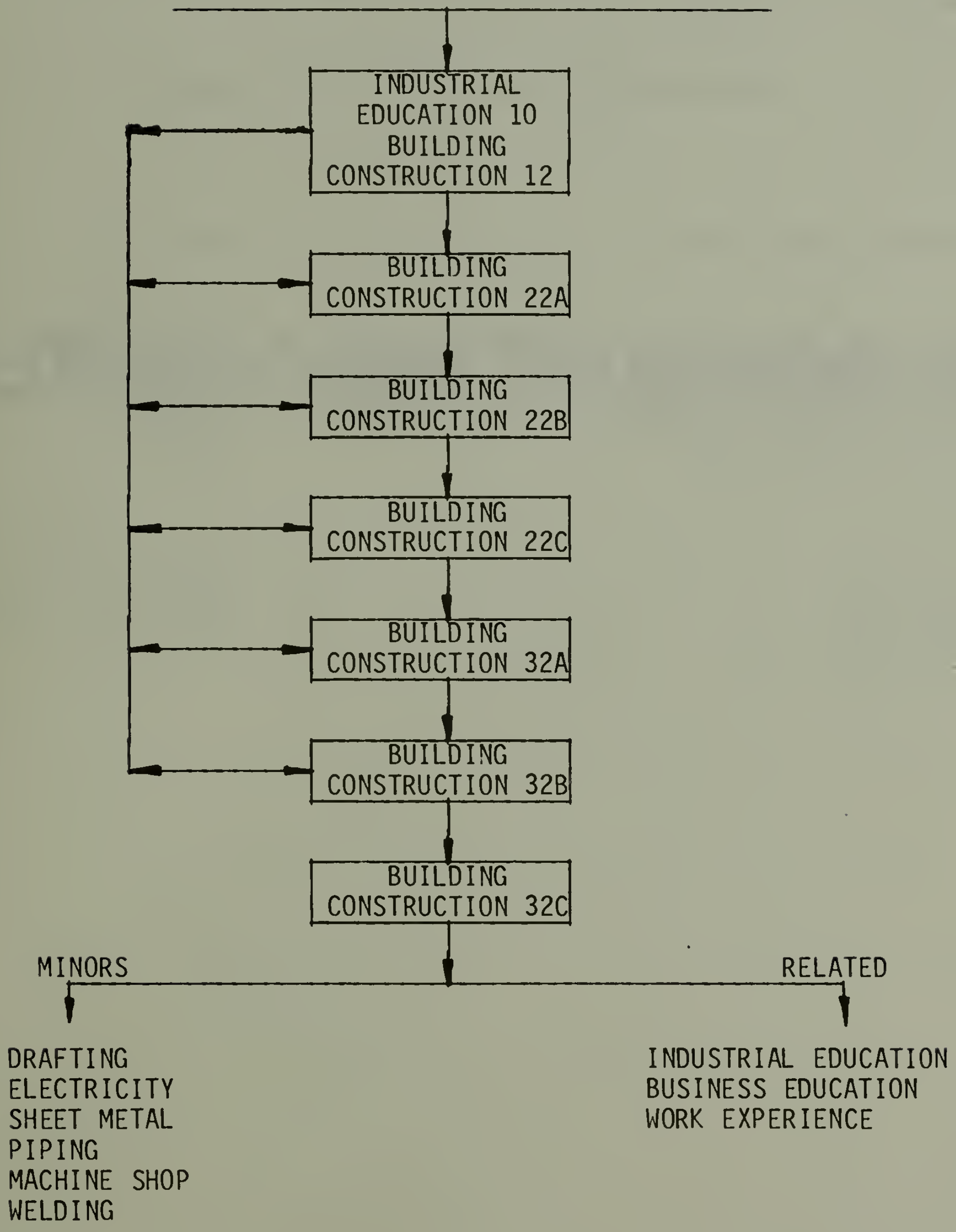
3. one half of a "12" course. The other half would be another half "12" or a module from the "10" program. The course would be recorded as Industrial Education "10".

Following the introductory course the student may advance to the major area of study by selecting any number of five credit modules from the courses designated as "22" or "32". The scheduling and sequencing of the modules is the responsibility of the local school personnel but must be in accordance with the regulations pertaining to prerequisites.

A student registered in a second or third level course ("22" or "32") is regarded as taking a major in that course area. Having established a major the student may select courses designated as minors and in this way broaden his/her practical skill base in a career field or even several career fields. However, students must complete all the preceding modules in a major series (usually six) before taking the 32C module (exception: Beauty Culture).

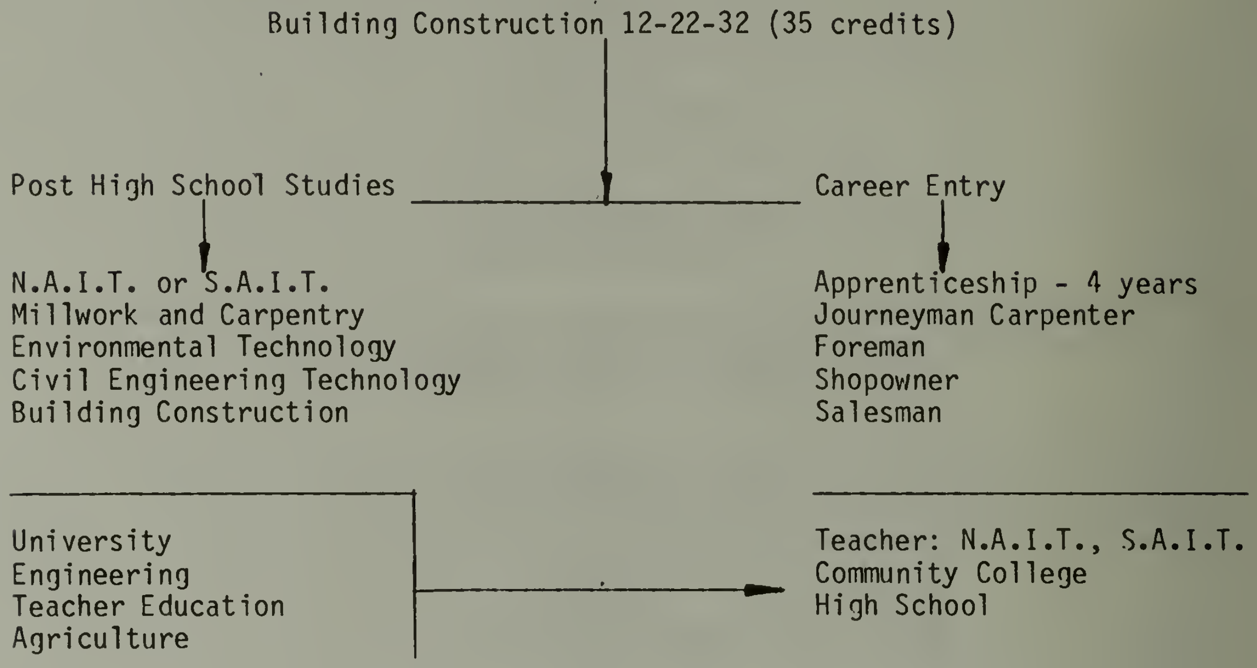
CAREER FIELD

BUILDING CONSTRUCTION



CAREER OPPORTUNITIES

Students taking all or most of the modules in the Building Construction major may look forward to the following opportunities:



BUILDING CONSTRUCTION 12

COURSE CONTENT

BUILDING CONSTRUCTION 12 (5 CREDITS)

INTRODUCTION

As inferred by the title, this module is to be very broad in nature: a high level of skill development will not be expected.

OBJECTIVES

The purpose of Building Construction 12 is:

1. To give the students an understanding of the building construction field and related occupations.
2. To introduce students to the safe use of tools and acceptable procedures basic to the field of construction.

REFERENCES

Cannon, K.F. and Hatley, F.G. Building Construction Technology. McGraw-Hill Ryerson 1982.

Groneman and Feirer. Getting Started in Woodworking. McGraw-Hill Ryerson, 1979.

Harris E. Introduction to Woodworking and Construction. McGraw-Hill Ryerson.

McDonnell, L.P. Handworking Tools. Delmar Publishers (Canada) Ltd., 1410 Birchmount Road, Scarborough, Ontario, 1962.

McDonnell, L.P. Portable Power Tools. Delmar Publishers (Canada) Ltd., 1410 Birchmount Road, Scarborough, Ontario, 1962.

*Miller, H.G. Hand and Machine Woodwork, Metric Edition. Macmillan of Canada, Toronto. (Gage Publishing Ltd.)

*Refers to Primary Text.

CONTENT SUMMARY:

1. Tool Processes Used in Measuring and Layout
   - measuring and layout tools
2. Safety
3. Shaping Materials
   - removal
   - combining
   - forming
4. Tool Maintenance
5. Applied Mathematics and Measurement
   - trade mathematics
   - measurement systems (English, metric)
6. Planning and Design
7. Materials
   - wood
   - glue
   - wood finishes
8. Career Field Study
   - occupations
   - employment opportunities

TOPIC 1: TOOL PROCESSES USED IN MEASURING AND LAYOUT VBC12

GENERALIZATION: Careful and accurate layout of material prior to shaping is essential.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
1. Measuring, Layout and Marking Tools	The student will: - learn the names and uses for a variety of these tools and use them in job situations - use the following tools both in shop drawings and on actual stock: steel measuring tapes; squares; rules; dividers; sliding T-bevels; marking gauges; pencils; straight edge; trammel points	5	

TOPIC 2: SAFETY CONSCIOUSNESS VBC12

GENERALIZATION: A knowledge and practice of safety is essential to all shop activities.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
1. Working Safely	The student will: - learn the safe procedures in carpentry and construction as they relate to: lifting; climbing and descending ladders; edge tool use; electrical wires; power tools; protective clothing; eye shields; hearing protection; respiration protection; general housekeeping	2	

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
2. Unsafe Act	- list the possible hazards in carpentry and construction as they relate particularly to the above		
3. Unsafe Conditions	- discuss how to identify conditions which could lead to injuries on the job - list benefits under the Workers' Compensation Act.		

NOTE: Instructors should inform students that power tools are not to be used until they are instructed in their use.

TOPIC 3: TOOL PROCESSES USED TO SHAPE MATERIALS VBC12

GENERALIZATION: Through the use of tools, materials are shaped by removing, combining and forming.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	20	
1. Removal	- identify and demonstrate the proper use of the following cutting, smoothing, and boring tools: handsaws; chisels; planes; knives; scrapers; surform tools; brace and bits; twist drills; countersinks. (It is recommended that strong emphasis be placed on hand tools as opposed to the following power tools)		

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- use the radial arm saw, table saw, band saw, scroll saw, drill press to cut up large materials for projects and jobs	10	
	- joint the edge of boards on the thickness planer		
	- plane boards to thickness using the thickness planer		
2. Combining:			
- Mechanical	- identify the names and demonstrate the uses of a number of assembling and holding tools, such as: hammers, nail sets, screw drivers, clamps, vises, saw horses, staplers		
	- identify various types and uses of nails and screws		
- Adhesion	- discuss various types of glues and adhesives and their special uses		
	- make a glue joint with a minimum length of 8" (203mm) using furniture glue, e.g., bondfast		
3. Forming	- describe how to shape wood by: - laminating - steaming - kerfing	5	

NOTE: Students will use tools a great deal more in later modules such as "Cabinetmaking". This is merely the introductory stage and more complex uses will be learned as necessary. The uses of power tools generally should be limited to the preparation of materials for hand tool projects.

TOPIC 4: TOOL MAINTENANCE

GENERALIZATION: In order to do the best possible job with the least effort and maximum safety, tools must be maintained in excellent condition.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:		
1. Maintenance: - Grinding	- define the correct angles for grinding plane irons and chisels.		
	- make practice grinds with 1/8" (3mm) thick by 1" (25mm) wide steel		
	- grind a tool to a square face, with one continuous grind angle and no burn		
- Whetting	- whet plane irons and chisels to maintain sharpness between grindings		
	- sharpen tools from home for extra practice		
- Adjusting	- keep tools properly adjusted by maintaining the tools he/she uses; frequent checks by the teacher will encourage students to check tools they are using		
	(students, each in turn through the module, may be asked to check the condition of tools in the shop)		
- Cleaning	- clean off rust, gum, pitch, etc., from tools (oven cleaner for gum and pitch)		

NOTES:

TOPIC 4: TOOL MAINTENANCE (continued) VBC12

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- clean and polish tools using wire brushes and wet or dry sandpaper - polish tools to a smooth finish - take proper care of paint brushes and be required to demonstrate this knowledge after painting or varnishing - describe the different types of thinners/cleaners for different finishing materials - clean brushes		

NOTE: Saw filling will be done by students in later modules.

TOPIC 5: MEASUREMENT AND APPLIED MATHEMATICS VBC12

GENERALIZATION: Skilled tradesmen must be able to perform elementary mathematical computation and understand relationships between measuring systems.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
1. Trade Mathematics:	The student will:		
- Addition	- add whole numbers, fractions, and decimal fractions		
- Subtraction	- subtract whole numbers, fractions, and decimal fractions		

TOPIC 5: MEASUREMENT AND APPLIED MATHEMATICS (continued) VBC12

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
- Multiplication	- multiply whole numbers, fractions, and decimal fractions		
- Division	- divide (as above)		
- Percentages	- use percentages to find % wastes, % discounts, % distances, % interest		
- Ratio and Proportion	- calculate pulley speeds, rim speeds of blades, etc. (Work sheets will be required in all mathematical areas)		

NOTE: Metric measurement must be used throughout.

TOPIC 6: PLANNING AND DESIGN VBC12

GENERALIZATION: Planning and design are essential prior to the construction of an attractive and durable product of any kind (shop project, cabinet, or building).

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:		
1. Shop Drawing and Sketching	- use and care for the basic drafting tools - use basic drawing procedures (e.g., centering, drawing, vertical, horizontal, and sloping lines, drawing arcs and circles) - use basic lettering procedures		

NOTES:

TOPIC 6: PLANNING AND DESIGN (continued) VBC12

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- use the most common scales - make simple sketches of projects - prepare drawings for simple projects they build (e.g., sanding block, bench hook, coping saw jig, etc.)		

TOPIC 7: MATERIALS VBC12

GENERALIZATION: Basic construction procedures and the unique characteristics of materials (required to use each to its best advantage) must be understood by the carpenter.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:		
1. Wood: - Structure and Classification	- classify wood according to species. (Students should be given samples of commonly used hardwoods to identify.) - study charts and diagrams on the cross-section of a tree and of cell structure (may use cross-sections of actual trees) - classify wood on the basic of physical properties such as: density; hardness; durability; strength; color; workability		

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- conduct experiments to illustrate the properties listed		
- Lumber	- recognize common lumber defects and diseases; defects related to: growth; seasoning; diseases; milling		
- Manufactured Wood Products	- identify commonly used types of lumber as to size		
	- identify commonly used manufactured wood products, their characteristics and uses: plywood; hardwood; fibre board; particle board; others		
- Grading	- identify manufacturers marks		
2. Glue:			
- Types and Properties	- list four types of glue commonly used today		
	- list advantages and disadvantages of each type		
	- list specific uses for each type of glue		
- Procedures	- perform basic gluing procedures to produce maximum strength		
3. Wood Finishes	- identify the purposes of wood finishes		
	- identify the basic types of paints, varnishes, stains, oils, etc.; discuss selection and methods of application		

TOPIC 7: MATERIALS (continued) VBC12

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- describe the types of thinners available for each type of finishing material - apply various finishes to different wood samples and projects		

NOTE: Commonly used products only should be introduced in this topic; other materials will be studied as encountered in later modules.

TOPIC 8: CAREER FIELD STUDY VBC12

GENERALIZATION: There are many occupations within and related to the career field of Construction and Fabrication.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:		
1. Career Field Occupations:	- discuss the various occupations available in the career field and entry requirements (Certification)		
- Employment Opportunities	- discuss employment opportunities in career choices		

NOTES:

BUILDING CONSTRUCTION 22A

COURSE CONTENT

BUILDING CONSTRUCTION 22A (5 CREDITS)

(CABINET AND FURNITURE MAKING)

INTRODUCTION

This course is open to any student having completed one of Building Construction 12, or Industrial Education 10. Students have the opportunity to use tools and materials which challenge them to high standards of workmanship in the production of cabinets and furniture.

OBJECTIVES

The purpose of Building Construction 22A is to introduce the student to basic design, materials and construction of cabinet work. It is recommended that a 70/30% division of time be maintained between the practical and theoretical portions of the program.

REFERENCES

Cannon, K.F. and Hatley, F.G. Building Construction Technology. McGraw-Hill Ryerson 1982.

Feirer. Cabinet Making. McGraw-Hill Ryerson.

Groneman. General Woodworking. 2nd Canadian Edition. McGraw-Hill Ryerson.

*Miller, H.G. Building Construction-Materials and Methods, Revised Metric Edition. Macmillan of Canada, Toronto. (Gage Publishing Ltd.)

*Refers to Primary Text.

CONTENT SUMMARY

1. Introduction to Cabinet and Furniture Making
    - design
    - material
    - processes
    - tools
2. Basics of Cabinet Making
    - joints
    - assembly
3. Finishing
    - reasons for finishing
4. Design
    - function
    - appearance

TOPIC 1: INTRODUCTION TO CABINET AND FURNITURE MAKING VBC22A

GENERALIZATION: Intelligent and effective work with wood requires a knowledge of design, materials, processes and tools.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	25	
1. Design	- define the elements of design: line; form; color; light and material		
	- explain the principles of design: balance; harmony; proportions; scale and their applications to furniture design		
2. Material	- describe the properties and structure of woods and be able to determine their suitability for particular applications		
	- describe the surface characteristics of lumber		
	- study the various species of wood		
	- describe the basic processes of lumber production: sawing; seasoning; grading; planing; plywood manufacture		
3. Processes	- perform the basic woodworking processes: sawing; surfacing; shaping; joinery; fastening		

NOTES:

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
4. Tools	- classify tools according to their purpose and use: measurement, layout and testing; cutting; smoothing; boring, drilling and mortising; assembly tools; dismantling; abrasive; holding and supporting; impelling and percussion. - use handtools, safely and efficiently - care for and maintain tools in good condition - practice the general safety rules for operating power tools - operate stationery and portable power tools safely: saws; planners and jointers; portable routers; mortisers and borers; sanders		

NOTES:

TOPIC 2: BASICS OF CABINET AND FURNITURE MAKING VBC22A

GENERALIZATION: Cabinet and furniture making is based on acceptable standards of jointing and assembly.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	20	
1. Jointing	- identify cabinet and furniture components - distinguish between "lay-up" and assembly joints - identify the factors to be considered when selecting a joint for a particular purpose: material type and size; strength; method of fastening; equipment available; workmanship; serviceability - make the basic joints using hand and/or power tools: edge to edge; lap; dado; rabbet; mitre; mortise and tenon; dovetail; coped - describe the basic rail joints used - identify the basic frame joints used - describe the basic joints for jointing rails to legs - describe the common methods of attaching doors		

NOTES:

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- describe the common methods of providing for shelves		
	- describe the common methods of making drawers and guide mechanisms		
2. Assembly	- identify the types and uses of adhesives		
	- identify the types and uses of nails commonly used		
	- identify the types and uses of wood screws and bolts commonly used		
	- identify types and uses of cabinet hardware		
	- clamp stock for assembling and gluing		
	- describe the factors that determine the most suitable type of fastener for a particular job		
	- apply plastic laminates		

NOTES:

TOPIC 3: FINISHING VBC22A

GENERALIZATION: Finishing protects, preserves and beautifies the materials.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	15	
1. Protecting and Preserving	- define the purposes of finishing as applied to cabinet and furniture making		
	- name the types of finishes used: paints and enamels; varnishes and lacquers; stains; fillers and sealers; oils; waxes		
	- select finishes and apply to the projects being built		
2. Beautify	- identify the finishing abrasives used: sandpaper; steel wool; pumice stone; rotten-stone; rubbing compound		
	- describe the methods and procedure in the application of: paints and enamels; varnishes and lacquers; stains; fillers and sealers; oils; waxes		
	- observe the safe and recommended practices in the application of finish materials		

NOTES:

TOPIC 4: DESIGN VBC22A

GENERALIZATION: Furniture and cabinets must be functional and aesthetically pleasing.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	15	
1. Function - in rooms where cabinets and built-ins are located, the utility and livability depends on the balance and locations of the cabinets	- apply standards in relation to height, width and depth for: kitchen cabinets; bathroom vanities; wardrobes and storage closets - design an efficient, attractive and easy to maintain kitchen based on: centers of activity; basic shapes; style		
2. Appearance: - furniture forms and proportions are based on the needs of the human body for utilitarian and aesthetic purposes	- design and build such projects as: single pedestal desk; night table with drawer, etc.		

NOTES:

BUILDING CONSTRUCTION 22B

COURSE CONTENT

BUILDING CONSTRUCTION 22B (5 CREDITS)

(CONCRETE AND FORM BUILDING)

INTRODUCTION

Students may register in Building Construction 22B following completion of one of Building Construction 12, or Industrial Education 10.

OBJECTIVES

The objectives of Building Construction 22B are:

1. To give the students practical experience in basic surveying for building layout.
2. To give students practice in constructing concrete forms.
3. To give students the opportunity to learn the properties of concrete, and mix and place it.
4. To give students practice in quantity survey methods.

REFERENCES

Cannon, K.F. and Hatley, F.G. Building Construction Technology. McGraw-Hill Ryerson 1982.

Canadian Portland Cement Association. Design and Control of Concrete Mixtures. (Metric Edition).

Hurd. Formwork for Concrete. ACI Publication SP-4, American Concrete Institute, Detroit.

*Miller, H.G. Building Construction-Materials and Methods. Metric Edition. Macmillan of Canada, Toronto. (Gage Publishing Ltd.)

National Building Code. Residential Standards, (Current Edition). National Research Council.

Willis H. Wagner. Modern Carpentry. Goodheart-Willcox, 1979 Edition.

*Refers to Primary Text.

CONTENT SUMMARY

1. Principles of Laying Out Building Lines

    - legal description
    - reference points, soils and excavations
    - measurement of quantities

2. Introduction to Concrete Form Construction

    - foundations and footings
    - design of forms
    - measurement of quantities

3. Form Construction, Measurement of Quantities

4. Principles and Practices of Making Concrete

    - definition of concrete
    - materials used
    - proportions
    - testing
    - estimating

TOPIC 1: PRINCIPLES OF LAYING OUT BUILDING LINES

GENERALIZATION: Building lines are essential to provide proper reference points in positioning a structure on its site.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	20	
1. Preliminary Building Information	- identify and select the sources of information needed to establish building lines: plan of town, city or subdivision; zoning laws; survey points; datum points - through the study of town or city planning system, zoning laws, and plot plans, demonstrate how information for building lines can be used for a specific structure		
2. Reference Points	- through the use of a simulated exercise or actual lot layout: locate lot stakes; determine setback and side location; layout foundation lines using 3:4:5 method, survey instruments - erect batter boards - transfer building lines to batter boards		
3. Soil Types	- identify the different types of soil conditions encountered in construction and assess their suitability as a bearing material: sand; clay; gravel; rock; land fill		

NOTES:

TOPIC 1: PRINCIPLES OF LAYING OUT BUILDING LINES (continued) VBC22B

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
4. Excavation	- Given a set of blueprints: - prepare a quantity survey of excavation materials for each of the following: top soil; mass excavation; hand excavation; backfilling; trenching; haulage		

NOTE: The neatness and accuracy of the presentation will be of a standard acceptable to the teacher and consistent with current industrial practices.

TOPIC 2: INTRODUCTION TO CONCRETE FORM CONSTRUCTION VBS22B

GENERALIZATION: Foundations are essential for all types of structures and must be designed for load conditions and various soil conditions.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	15	
1. Foundations and Footings	- identify footings of the following types: wall or strip footings; column footings; porch and stair footings; stepped footings; chimney footings - identify foundation types: wall foundations; slab foundation; pier and column foundations		

NOTES:

TOPIC 2: INTRODUCTION TO CONCRETE FORM CONSTRUCTION (continued) VBC22B

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- describe the difference between: spread type footings; pier footings; pile footings - given a set of blue-prints, be able to recognize the types of footings and foundations used in the building - identify live and dead loads - identify loads transmitted - determine the width and depth of footings according to Residential Standards		

TOPIC 3: FORM CONSTRUCTION VBS22B

GENERALIZATION: Forms are required to contain and to support the materials of concrete construction.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	50	
1. Forms	- describe form requirements related to: size and shape; strength; watertightness; economy - identify the material used in form construction: wood; plywood; metals; earth		

NOTES:

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- describe the function, requirements and relationship of each member of concrete forms: shoe, plate; stud; waler; spreader; brace; stake; strong-back - apply Residential Standards for: form design; form construction; tie spacing - construct and set forms for: typical wall footings; column footings; stepped footings - define methods used to secure foundation: keyways; steel dowels - build typical wall foundation forms including the setup of: sectional plywood forms; tie systems; walers; plumbing and alignment of forms; typical corner construction; setting of rough bucks for windows and doors; bulkheads - describe the stripping of forms and their preparation for reuse - examine methods of anchoring floor systems to foundation walls: sill and anchor bolts; cost-in-place joists		

NOTES:

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- illustrate methods used and be able to select suitable forming for: steps on sloping ground; open steps; stairways		
	- explain the methods used in building: concrete walks; concrete driveways and patios; concrete floors		
	- apply Residential Standards requirements for waterproofing and damp-proofing of floors and walls below grade		
2. Estimating	- given a set of plans and cost data, the student will prepare a quantity and cost survey of the form material required for the construction of: strip footings; column footings; concrete steps; sidewalks		

NOTES:

TOPIC 4: PRINCIPLES AND PRACTICES OF MAKING CONCRETE VBC22B

GENERALIZATION: Concrete as a durable material is used extensively for varied building purposes.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	40	
1. Concrete as a material	- define concrete - identify the ingredients of concrete - identify the desirable properties - identify the desirable properties of hardened concrete		
2. Quality concrete is made with carefully selected and properly proportioned ingredients	- summarize the manufacturing process of Portland cement - identify the common types of Portland cement - describe the types of aggregates based on: standard tests; desirable characteristics; gradation - determine the suitability of mix water for concrete		
3. Quality concrete is dependent upon the thorough mixing of properly proportioned materials and the proper placing, finishing and curing of the resulting mix	- discuss the importance of job conditions in selecting mix characteristics of concrete: workability; durability; strength-emphasis on the water/cement ratio - design a mix for specification application using volume and/or weight design methods		

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- conduct slump tests on concrete mixes - prepare compressive test cylinders in accordance with standard test procedures - place concrete - finish concrete surfaces - cure concrete		
4. Estimating	Given a set of plans and cost data, the student will prepare a quantity and cost survey of the following materials: - concrete for: footings; walls; steps; sidewalks; floors; driveways - use reinforcement - use waterproofing and dampproofing - use drainage: weeping tile; coarse gravel		

NOTE: The teacher may want to teach quantity measurement of dry ingredients.

BUILDING CONSTRUCTION 22C

COURSE CONTENT

BUILDING CONSTRUCTION 22C (5 CREDITS)

(FRAMING - RESIDENTIAL)

INTRODUCTION

This course is open to any student who has completed any one of Building Construction 12, or Industrial Education 10.

OBJECTIVES

The purpose of Building Construction 22C is:

1. To give the students practical experience in house framing.
2. To give students a basic knowledge of various types of framing and layout procedures in accordance with the codes regulating construction.
3. To give the students practical experience in material quantity and cost estimating.

REFERENCES

Cannon, K.F. and Hatley, F.G. Building Construction Technology. McGraw-Hill Ryerson 1982.

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Central Mortgage Housing Corporation, Ottawa. Canadian Wood-Frame House Construction.

Jones, R.P. Framing, Sheathing and Insulation. Delmar Publishers (Canada) Ltd., 1410 Birchmount Road, Scarborough, Ontario.

*Miller, H.G. Building Construction-Materials and Methods. Macmillan of Canada, Toronto. (Gage Publishing Ltd.)

Smith, R. Materials of Construction. (3rd Edition). McGraw-Hill Ryerson.

Smith, R. Principles and Practices of Light Construction. Prentice-Hall, 1980.

Wagner, Willis H. Modern Carpentry. Goodheart-Willcox, 1979.

*Refers to Primary Text.

CONTENT SUMMARY

1. Floor Support and Framing Systems
    - wood foundations
    - built-up beams, girders and columns
    - floor joist systems
    - bracing
    - floor sheathing
    - quantity and cost survey

2. Wall Framing
    - basic framing systems
    - platform framing
    - wall sheathing
    - quantity and cost survey

3. Ceiling and Roof Framing
    - ceiling framing
    - roof framing
    - cornice work
    - roof sheathing
    - special ceiling and roof framing systems

TOPIC 1: FLOOR SUPPORT AND FRAMING SYSTEMS VBC22C

GENERALIZATION: Accurate lay-out and erection of floor support and framing systems is basic to quality construction.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	30	
1. Wood Foundations	- identify the components of a wood foundation system: base preparation; sole plate; studs; sheathing; water-proofing; floor slab; back-filling - describe the procedures for: site preparation; types of footings; special framing techniques		
2. Built-up Beams, Girders and Columns	- identify several residential types: Posts: solid timber; built-up; spaced; concrete; steel adjustable Beams: solid timber; built-up (laminated); concrete; box beam; wood and steel; steel I; bearing walls - using Residential Standards recommend, design and/or construct beam, girder and column systems for prescribed spans, jobs and loads		

NOTES:

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
3. Floor Joist Systems	- identify several types of residential floor joists: solid timber; concrete; steel; truss - using Residential Standards recommend joist size and o.c. spacing for prescribed spans, jobs, and loads - describe or identify acceptable joist to beam connecting systems: overlap; joist hangers; ledgers and ribbons		
4. Bracing	- state the main functions of, and identify a number of acceptable bridging systems: solid blocking; strip; cross bridging (wood); continuous metal; nailess metal - lay out and cut wood cross bridging for floor joist - construct scale models, sectional mock-ups, or actual job structures of floor frames including: o.c. lay out; sill assembly; beam placement; floor openings, bridging placement		
5. Floor Sheathing	- name various types of sub-flooring: solid lumber - T & G; shiplap; square edge panel type - plywood - composition		

NOTES:

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- using Residential Standards suggest suitable subfloor for prescribed joist spacing indicating proper fastening systems: nails; staples; adhesives; screws		
6. Quantity and Cost Survey	From blueprints and working drawings, using current prices, students will: - estimate material quantities and costs for complete floor framing systems including: posts and beams; floor joists; bracing; floor sheathing; fastening systems - include in estimates acceptable limits for wastage - use current units of measurement		

NOTE: Throughout this section, field trips to construction sites are recommended for purposes of firsthand experience in identifying and recognizing structural systems and components.

TOPIC 2: WALL FRAMING VBC22C

GENERALIZATION: There are several basic framing systems presently employed in Canadian residential construction. In Alberta, the most common framing method is platform or Western.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	40	
1. Basic Framing Systems: - platform - balloon - post and beam - plank wall - rigid frame - log - masonry - arch rib	- discuss the various systems, noting structural and aesthetic advantages and disadvantages of each, and assembling methods - identify the components of each framing method as to: name; purposes; standard sizes		
2. Platform Framing	- construct scale models, sectional mock-ups or actual building projects requiring: plate lay-out; stud placing and nailing; framed wall opening; corner post assembly; sway bracing; wall erection to square and plumb; from Residential Standards, determine proper stud size and spacing, lintel sizes and fastening specifications		
3. Sheathing (wall)	- examine various common sheathing materials and types and discuss the advantages and disadvantages of each - from Residential Standards determine appropriate sheathing fastening methods		

NOTES:

TOPIC 2: WALL FRAMING (continued) VBC22C

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
4. Quantity and Cost Survey	- from blueprints and working drawings, using current prices; - estimate material quantities and costs for complete wall framing with emphasis on the platform system, including: plates; studding; wall openings; bracing; wall sheathing; fastening systems - include in estimates acceptable limits for wastage - use current units of measurement		

NOTE: Field trips would enhance this section considerably.

TOPIC 3: CEILING AND ROOF FRAMING VBC22C

GENERALIZATION: An integral part of completing the house frame is a well designed and carefully constructed ceiling and roof system.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	55	
1. Ceiling Frame	- select thickness and width for ceiling joists and beams to suit various spans - attach joists over a beam and to the side of a flush beam (joist hangers, ledgers, etc.)		

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- frame rough openings and install backing and blocking for partitions and ceiling finish		
2. Roof Framing	- recognize or describe common roof designs: flat; shed; gable; cottage or hip; intersecting; Gambrel; Mansard		
	- define and explain the relationships between the terms rise, run, slope, and line length		
	- identify the two major tasks in rafter lay-out: calculation of length; layout of exact angles		
	- name the types of rafters used for each roof type		
	- use several methods to calculate rafter line length: scaling the square; scale drawing; mathematical; step-off; rafter table on framing square		
	- on full size stock, lay out several of each rafter type, showing all calculations, adjustments, and cutting lines: common rafter; hip rafter; valley rafter; jack rafter		
	- construct a roof model of convenient size and type		

TOPIC 3: CEILING AND ROOF FRAMING (continued) VBC22C

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- from Residential Standards, select proper rafter stock and o.c. spacings for prescribed roof problems		
3. Cornice Work	- show by shop drawing or describe a completed cornice including: rafter tail cuts; rough and finish fascia; look-out framing; soffits - complete cornice of above mentioned roof model		
4. Roof Sheathing	- identify various roof sheathing materials and systems: solid lumber (solid cover); solid lumber (spaced); panel type		
5. Special Ceiling and Roof Framing Systems	- name and draw several common roof trusses: W-truss; king post truss; scissor truss; blow string truss, etc. - explain the load bearing principle of trusses - discuss various truss connectors: gusset plates; shear plates; split rings - with reference to Residential Standards construct scale models of several types of trusses emphasizing spans, and stock size		

NOTE:

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
6. Quantities and Cost Survey	- from blueprints and working drawings, using current prices: - estimate material quantities and costs for complete roof frames of the types: flat roof; gable roof; cottage or hip roof - estimates to include: ceiling joists; ceiling backing; rafters; ridge boards; collar ties; rough fascia; lookout framing; roof sheathing; fastening systems - include in estimates, acceptable limits for wastage - make comparative estimates on conventional rafter type roof framing as opposed to trussed type roof framing - use current units of measurement		

NOTE: Again, study of actual roofs while on field trips would prove useful.

This complete module, Building Construction 22C, could be greatly enhanced if the class could assume the task of constructing a project such as a garage, small cottage or some similar structure. Emphasis must be placed on planning, organizing, cooperating, and job safety from the beginning to end.

BUILDING CONSTRUCTION 32A

COURSE CONTENT

BUILDING CONSTRUCTION 32A (5 CREDITS)

(EXTERIOR FINISHING)

INTRODUCTION

This module aims primarily at introducing the student to exterior finishing in residential construction. Although Blueprint Reading, Drawing and Sketching has been dealt with in other modules, it should be pursued in greater depth in this module. Students may register in Building Construction 32A following completion of one of Building Construction 12, or Industrial Education 10.

Emphasis should be placed on student activity through on-site projects or mock-ups.

OBJECTIVES

The purpose of Building Construction 32A is:

1. To give the student experience in understanding working drawings and sketching.
2. To develop an understanding of the influences of materials and design on exterior finishing.
3. To develop an awareness of materials, tools, and procedures used in completing the exterior of a house.

REFERENCES

Bellis and Schmidt. Blueprint Reading for the Construction Trades. McGraw-Hill Ryerson, 1978.
Cannon, K.F. & Hatley, F.G. Building Construction Technology. McGraw-Hill Ryerson, 1982.
Hornung, W.J. Blueprint Reading. Prentice-Hall, Englewood Cliffs, N.J.
*Miller, H.B. Building Construction - Materials and Methods, Metric Edition. Macmillan of Canada, Toronto. (Gage Publishing Ltd.)
Smith, Ronald. Principles and Practices of Light Construction. 1980 Edition. Prentice Hall.
Sundberg, Elmer, W. Building Trades Blueprint Reading. American Technical Society, Chicago, Illinois.
Walker, Frank R. The Building Estimators Reference Handbook. Frank R. Walker Co., Chicago, Illinois. Latest edition.
Wass, Alonzo. Building Construction Estimating. Prentice-Hall Inc., Englewood Cliffs, N.J., 1963.

*Refers to Primary Text.

NOTE: Free booklets available from lumber dealers and Central Mortgage Housing Corporations.

CONTENT SUMMARY

1. Introduction to Exterior Finishing
    - design
    - materials

2. Blueprint Reading, Arcitectural Drawing, and Sketching
    - blueprint reading
    - working drawings
    - pictorial drawings
    - freehand sketching

3. Safety
    - scaffolds and ladders
    - power and hand tools

4. Roof Coverings
    - materials and systems
    - quantities and cost survey
    - application

5. Cornice and Eave Projection
    - materials and systems
    - quantities and cost survey
    - application

6. Exterior Doors and Windows
    - materials and types
    - installation
    - hardware

7. Exterior Wall Coverings
    - preparation
    - materials
    - quantity and cost survey

8. Exterior Trim
    - materials
    - quantity and cost survey
    - application

9. Pictorial Drawing
    - pictorial Delete
    - isometric

TOPIC 1: INTRODUCTION TO EXTERIOR FINISHING VBC32A

GENERALIZATION: Aesthetically pleasing finished appearances are created by attention to selection of design and materials.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	10	
1. Design	- identify the basic elements of design: form; space; light and shadow; line, texture and color as used in house design		
	- explain how the basic elements of design are used to achieve: unity; repetition; rhythm; balance		
2. Materials	- make an analysis of general types of materials used for finishing purposes: wood; glass; composition materials; tile; masonry; metal; plastics		
	- obtain information from various sources to determine proper selection and application of materials to acceptable standards		
	- explain how building design and construction techniques affect material development		

NOTE: It is intended that for information retrieval purposes, the student will make frequent references to blueprints in all Building Construction courses. Time allocated to the topic in this course is for the purpose of pursuing the subject in greater depth.

TOPIC 2: BLUEPRINT READING, ARCHITECTURAL DRAWING AND SKETCHING

VBC32A

GENERALIZATION: The most effective means of communicating information between designer, builder and client is by extensive use of drawings, sketches and symbols.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	35	
1. Blueprint Reading	- identify the drawings which are to be found on a typical set of residential blueprints - develop proficiency in selecting specific information from the blueprints - prepare a drawing sheet containing typical construction symbols used for: construction; electrical; heating; plumbing		
2. Working Drawings:			
- Orthographic Drawings	- prepare an orthographic drawing of a garage showing the plan view, elevations and typical section views		
- Sectional Drawings	- prepare a typical vertical cross section of a wall from footing to roof		
- Detail Drawings	- develop drawings of construction details: cornice; stairs; doors; windows and joist assembly		

NOTE:

TOPIC 2: BLUEPRINT READING, ARCHITECTURAL DRAWING AND SKETCHING (continued)

VBC32A

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
3. Pictorial Drawing	- produce an isometric drawing of a typical construction project, given pertinent dimensions and specifications. Examples: cabinet, stair		
4. Freehand Sketching	- produce a freehand sketch, e.g., construction details: cornice; stairs; doors; windows and joist assembly		

NOTE: Freehand sketching should be used by the students throughout the program.

TOPIC 3: SAFETY

VBC32A

GENERALIZATION: All craftsmen should be thoroughly familiar with the safety requirements of their own specific work.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	5	
1. Scaffolds and Ladders	- discuss the types of scaffolds and ladders commonly used in construction - use ladders and scaffolds safely - identify the requirements for constructing and erecting scaffolds and ladders		
2. Power and Hand Tools	- safely and correctly, handle and use all types of tools: stationary machines; portable power tools (electric, power activated, pneumatic); special hand tools		

TOPIC 4: ROOF COVERINGS VBC32A

GENERALIZATION: Roof coverings provide weather protection, some measure of fire resistance and usually have a high durability-low upkeep factor. Because of high visibility, they can contribute to building attractiveness through color, texture and pattern.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	20	
1. Materials and Systems	- list and identify the prominent features of different roof materials and systems: built-up; rolled; wood shingles-shakes; asphalt; tile and slate; metal		
	- identify and describe the use of related materials used in roofing: papers, felts; flashings, sealants; nails, staples		
2. Quantities and Cost Survey	- calculate quantities and material costs of roofing materials		
3. Application	- summarize the principles and methods used in application of different roof coverings		
	- apply roofing materials		

NOTES:

TOPIC 5: CORNICES AND EAVE PROJECTION VBC32A

GENERALIZATION: Cornice arrangements can be of many types and styles to suit different architectural designs.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	15	
1. Materials and Systems	- list the functions of cornices - identify the common types of cornices: flush systems; open; boxed - describe the materials and systems that are used for cornice and eave construction - define terms used		
2. Quantities and Cost Survey	- calculate material quantities and costs for finishing eaves		
3. Application	- discuss basic techniques used in cornice construction - complete a cornice project on-site or on a simulated project		

NOTES:

TOPIC 6: EXTERIOR DOORS AND WINDOWS VBC32A

GENERALIZATION: House entrances are a distinctive feature of a home and a focal point of interest. Windows are a major building component, providing light, and ventilation while adding to appearance.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	15	
1. Materials and Types	- explain principles of window and door design - identify the basic styles and types of doors and windows - compare features of different materials used in window and door construction - summarize common sizes and define terms related to doors and windows - read a door and window schedule		
2. Installation	- discuss the procedure for preparation for installation; techniques used for installation of window and door frames as well as complete units - install units on-site or on simulated projects		
3. Hardware	- discuss the various types of door hardware - install door hardware on actual simulated units		

NOTES:

TOPIC 7: EXTERIOR WALL COVERINGS VBC32A

GENERALIZATION: Many houses incorporate two or more types of exterior wall coverings that complement each other while providing wall protection and increasing thermal resistance.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	20	
1. Preparation	- identify building paper types and desirable installation requirements - discuss the preparation required for different wall coverings: starter strips; drip cap; flashings; furring		
2. Materials	- identify various types and styles of exterior wall siding of different materials: wood; metal; plastics; asbestos; composition - discuss accessories necessary for sidings, including caulking - describe other types of wall coverings: stucco; brick veneer		
3. Quantity and Cost Survey	- calculate quantities and costs of wall covering materials		
4. Application	- discuss methods of installing various wall coverings - develop the necessary skills for application of the most common types of sidings used		

NOTES:

TOPIC 8: EXTERIOR TRIM VBC32A

GENERALIZATION: Ornamental pieces of wood, metal or plastic are often used to conceal joints and intersections and to add to building design.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:		
1. Materials	- discuss materials used for exterior trim: mouldings, casings, railings; louvres, shutters		
2. Quantity and Cost Survey	- calculate quantities and costs of materials		
3. Application	- develop skill in fitting and joinery in application of trim materials		

TOPIC 9: PICTORIAL DRAWING VBC32A

GENERALIZATION: In order to provide an overview of a construction project, a pictorial representation is often necessary. Delete

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	9	
1. Pictorical/ Isometric Drawing	- given pertinent dimensions and specifications, produce an isometric drawing of a typical construction project, e.g., kitchen cabinet		Delete

NOTES:

BUILDING CONSTRUCTION 32B

COURSE CONTENT

BUILDING CONSTRUCTION 32B (5 CREDITS)

(INTERIOR FINISHING)

INTRODUCTION

This course is open to any student who has completed one of Building Construction 12 or Industrial Education 10. It is recommended that students also have a minimum of one of the second level courses (22).

OBJECTIVES

The purpose of Building Construction 32B is:

1. To give the students practical experiences with materials, special tools and trade procedures employed in interior finishing.
2. To introduce students to the principles of insulation, vapor barriers, ventilation and energy conservation.
3. To give students a basic understanding of construction management and related trades.
4. To give students a basic understanding of stair construction.
5. To give students a basic understanding of construction and installation of interior doors.
6. To give students a basic understanding of construction and installation of cabinets, vanities and closets.
7. To give students a basic understanding of how to apply protective and decorative coatings.

REFERENCES

Ball, John E. Exterior and Interior Trim. Delmar Publishers, 1975.
Cannon, K.F. & Hatley, F.G. Building Construction Technology. McGraw-Hill Ryerson 1982.
Central Mortgage Housing Corporations. A Glossary of House Building Terms.
Delmar Publishers (Canada) Ltd. Unit Course in Interior and Exterior Trim.
McDonnell, L.P. Hand Woodworking Tools. Delmar Publishers (Canada) Ltd., 1979.
McDonnell, L.P. Portable Power Tools. Delmar Publishers (Canada) Ltd., 1979.

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Smith, R.C. Principles and Practices of Light Construction. Prentice-Hall Inc., 1980.

Wilson and Werner. Simplified Stair Layout. Delmar Publishers (Canada) Ltd., 1947.

*Refers to Primary Text.

CONTENT SUMMARY

1. Management and Related Trades
   - project costs and bids
   - related trades

2. Insulation, Vapor Barrier, Ventilation
   - energy efficiency
   - insulation
   - vapor barrier
   - ventilation
   - energy conservation

3. Interior Walls, Ceilings, Floors, Trim
   - wall finishes
   - ceiling finishes
   - floor finishes
   - interior trim
   - quantity and cost surveys

4. Stair Construction
   - stair design
   - stair construction
   - handrails and balustrades

5. Interior Doors
   - types and accessories
   - fabrication and installation

6. Cabinets, Vanities and Closets
   - cabinets
   - shelving, bars, racks

7. Protective and Decorative Coatings
   - materials
   - application of materials

TOPIC 1: MANAGEMENT AND RELATED TRADES VBC32B

GENERALIZATION: Building Construction often requires an understanding of business and management and of the necessary interdependence with other trades.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	5	
1. Project Costs and Bids	- through discussion, become familiar with: - the need for accurate and concise estimates of quantities, material and labor costs - job overhead items - e.g.: salaries; temporary buildings; legal costs; permits; utilities; testing progress reports; professional services; clean-up; plant, etc. - general overhead items and allowances made - profit margins		
2. Related Trades	- list those items which may be included in a project bid, and be familiar with procedures involved in bidding on projects: plumbing; electrical; heating; plastering-drywall; sheet metal; painting; landscaping; other - discuss the sequence of related trade involvement in construction - describe special considerations which may be necessary for any specific related trade		

TOPIC 2: INSULATION, VAPOR BARRIER, VENTILATION VBC32B

GENERALIZATION: Proper insulation, vapor barrier and ventilation add to living comfort and energy efficiency.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	29	
1. Energy Efficiency	- describe the principles of heat transfer and loss - define the terms used in heat loss determination		
2. Insulation	- identify the types of insulating materials and specific characteristics of each material - make comparisons of thermal resistance of different insulating materials - install insulating materials - calculate the insulation costs		
3. Vapor Barriers	- describe the effects of moisture levels in buildings and materials and the problems of moisture penetration - list the function of vapor barriers and the different types and characteristics of each		
4. Ventilation	- outline the principles of effective ventilation and regulations pertaining thereto - discuss ventilation systems and their installation		
5. Energy Conservation	- discuss alternatives to contemporary methods of heating and heat retention		

NOTE: Throughout this course, the student will refer to blueprints to familiarize self with the information retrieval procedure as it applies to each aspect of construction.

TOPIC 3: INTERIOR WALLS, CEILINGS, FLOORS, TRIM VBC32B

GENERALIZATION: A wide variety of building materials are used for interior finishing purposes that are both functional and decorative.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	30	
1. Wall Finishes	- discuss the different types of wall coverings commonly used: wood; lathe and plaster - dry wall; clay products; wood substitutes; other		
	- describe methods of preparation for application of wall finishes: furring and backing; plaster grounds		
	- describe procedures for handling and storage of materials		
	- install: nails, screws and bolts; bands; shields and anchors		
2. Ceiling Finishes	- identify and compare different ceiling finishes: ceiling tile; suspended ceilings; gypsum; other		
	- describe installation procedures for various types of ceilings and install one or more types		
3. Floor Finishes	- identify and classify the types of materials used for finished flooring: wood; tile; concrete and terrazzo; resilient floorings; carpet		

NOTES:

TOPIC 3: INTERIOR WALLS, CEILINGS, FLOORS, TRIM (continued) VBC32B

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- describe the principles and practices of preparation for and installation of finish floorings		
4. Interior Trim	- describe types and sizes of wood mouldings and trim and their use - identify typical installation joinery - develop skill and workmanship in applying interior trim		
5. Quantity and Cost Survey	- make quantity and cost estimates for walls, ceilings, floor and trim - use conventional allowances for wastage		

TOPIC 4: STAIR CONSTRUCTION VBC32B

GENERALIZATION: Stairs correctly designed and built can provide safe and easy means of access to and descent form one level to another.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	30	
1. Stair Design	- explain the principles of stair design and stairway construction - identify the various types of stairways commonly used - name the parts of stairways		

TOPIC 4: STAIR CONSTRUCTION (continued) VBC32B

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
2. Stair Construction	- select information from a set of plans to lay out a stair - apply the information obtained from a set of plans to make mathematical calculations - lay out a set of stairs - cut, assemble and install a stair		
3. Handrails and Balustrades	- describe the procedure for installation of handrails - describe methods of closing off open stairways and stairwells		

TOPIC 5: INTERIOR DOORS VBC32B

GENERALIZATION: Closing off openings between rooms in a house provides for privacy and sound control.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	15	
1. Types of Doors and Accessories	- identify door types and use: hollow and solid core; mono, bifold, pocket, by-pass and folding doors - list and define terms commonly used in door installation - identify door frame types		

TOPIC 5: INTERIOR DOORS (continued) VBC32B

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	- discuss a variety of door hardware and its installation		
2. Fabrication and Installation	- fabricate and install door frames		
	- hang doors and install prefabricated door units		
	- develop skill in fitting and installing related hardware		

TOPIC 6: CABINETS, VANITIES, CLOSETS VBC32B

GENERALIZATION: Storage convenience is enhanced by well-designed and correctly installed cabinets and shelving.

CONCEPTS/SUBCONCEPTS	LEARNING TASKS	HOURS	REFERENCES
	The student will:	10	
1. Materials	- identify the various protective and decorative coatings used in industry: paints and enamels; varnishes and lacquers; stains; fillers and sealers; oils		
2. Application of Materials	- list the recommended uses of the various protective and decorative coatings		
	- discuss the procedures for application of different coatings		

NOTES:

BUILDING CONSTRUCTION 32C

COURSE CONTENT

BUILDING CONSTRUCTION 32C (5 CREDITS)

INTRODUCTION

This last module in the Building Construction major is open to students who have completed 30 credits or six modules in the major.

The 125 hours of instruction time available in this module may be used to:

a. Provide greater depth to a module taken previously. Individual students, groups of students or the whole class may elect to study an area in depth. This could be cabinet making, framing (commercial or residential), concrete work or any of the modules named in the Building Construction sequence.

b. Engage in actual construction work supervised by the Building Construction teacher as a work experience coordinator and a journeyman on the job.

c. Further preparation for students planning to enter apprenticeship.

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